

# Notes on African Cossidae

by

HARRY K. CLENCH

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## I. The African genus *Macrocossus* (*Lepidoptera: Cossidae*)

The type species and hitherto only member of the genus *Macrocossus* Auriv., *toluminus* Druce (better known under the synonymous name *rudis* Auriv.), is a not uncommon West African species, outstanding because of its large size, being indeed the largest in the *Cossinae*. Within a few months two new species belonging to this genus have come to hand, each from a different source. The first of these is represented by a series of more than a dozen specimens, taken by Dr. R. M. Fox at Harbel, Liberia; the second by a single male taken by Herr F. G a e r d e s in South-West Africa and submitted to me for study along with his other *Cossidae* by Dr. Walter F o r s t e r, of the Zoologische Staatssammlung in Munich. In the ordinary course of events I should have described the first in an annotated list of the Lepidoptera collected by Dr. Fox, now in preparation, and the second in the account of the G a e r d e s *Cossidae* which follows the present paper. This, however, would have dissipated discussion of two-thirds of the genus in two very different papers, in each of which, furthermore, much duplication would have been necessary. It appears preferable to bring them together in this paper, along with some additional information on the older species and on the genus as an entity.

### *Macrocossus* Aurivillius

*Aurivillius* 1901, Öfvers. Kongl. Vetensk. Akad. Förh. (Stockholm) 57 (no. 9): 1054 (Genotype: *M. rudis* Auriv. 1901, loc. cit. = *Cossus toluminus* Druce 1887, new synonymy); *Aurivillius* 1910, Sjöstedt's Kilimandjaro-Meru Exp. 9:51 (in key to genera of African *Cossidae* only); Dalla Torre 1923, Lepid. Cat. pars 29: 15; Gaede 1929, in Seitz, Großschmett. Erde 14: 540; Viette 1951, Lambill. 51: 59.

The genus may be characterized by the following combination of characters:

Antennae bipectinate to tip, the longest rami long to very long (9—14 shaft segments in length); vertex with a tuft of very long scales, erect or directed anteriorly between bases of antennae; frontal scaling short and rather appressed; palpi closely scaled, long, tightly appressed to head (and hence evenly and strongly upcurved). Thorax dorsally rather short, semi-appressedly scaled. Hind wing with frenulum of male distinct but short and probably functionless (retinaculum of fore wing present but much reduced in size);  $R_s$  and  $M_1$  usually close but distinctly separate at origins - in occasional individuals very short stalked. Legs with no arolium between tarsal claws. Male genitalia with uncus terminally minutely hooked; valvae bearing a few subterminal heavy teeth on dorsal border; basal hook of valva well developed, acuminate, without denticulae terminally. Anellus long bilobed, the lobes digitate, often slightly spatulate and either spiculate, scobinate or setose terminally.

By the absence of tarsal arolium belonging in section II of the subfamily (see following paper).

**Macrocoossus toluminus** Druce (new combination). (Plate I, figs. 1, 2)

*Cossus toluminus* Druce 1887, P. Z. S. 1887: 684 (Gambia; includes brief description of larva); Kirby 1892, Cat. Lep. Het. 1: 362 (*Trypanus* —); Dalla Torre 1923, Lepid. Cat. pars 29: 15 (*Cossus* —); Gaede 1929, loc. cit. infra (*Macrocoossus*, possibly = *rudis*).

*Macrocoossus rudis* Aurivillius 1901, Öfvers. Kongl. Vetensk. Akad. Förh. 57 (no. 9): 1054 (Mukinbunu, S. bank Congo R., over 300 km. from coast); Strand 1912, Arch. Naturgesch. 78. A. 12: 96 (Bomet, Sassagebiet, Belg. Congo); Dalla Torre 1923, Lepid. Cat. pars 29: 15; Gaede 1929, in Seitz, Großschmett. Erde 14: 541, pl. 79a (adds locality, S. W. Africa).

Among the characters given by Aurivillius as distinctive of the genus is the presence of a diagonal cross-vein between the middle of the hind wing cell and vein Sc. This a very constant trait in *toluminus*, but in the light of the two new species described below appears to be a species character, rather than a generic one, for in *caducus* this cross-vein is present, but very faint and arises near the base, while in *coelebs* it could not be found at all. Another venational trait of *toluminus* is a curious short spur-vein leaving Sc of the hind wing costad from just about the level of the end of the cell: it is not always fully developed and may occasionally be completely absent; it does not appear in the single female available.

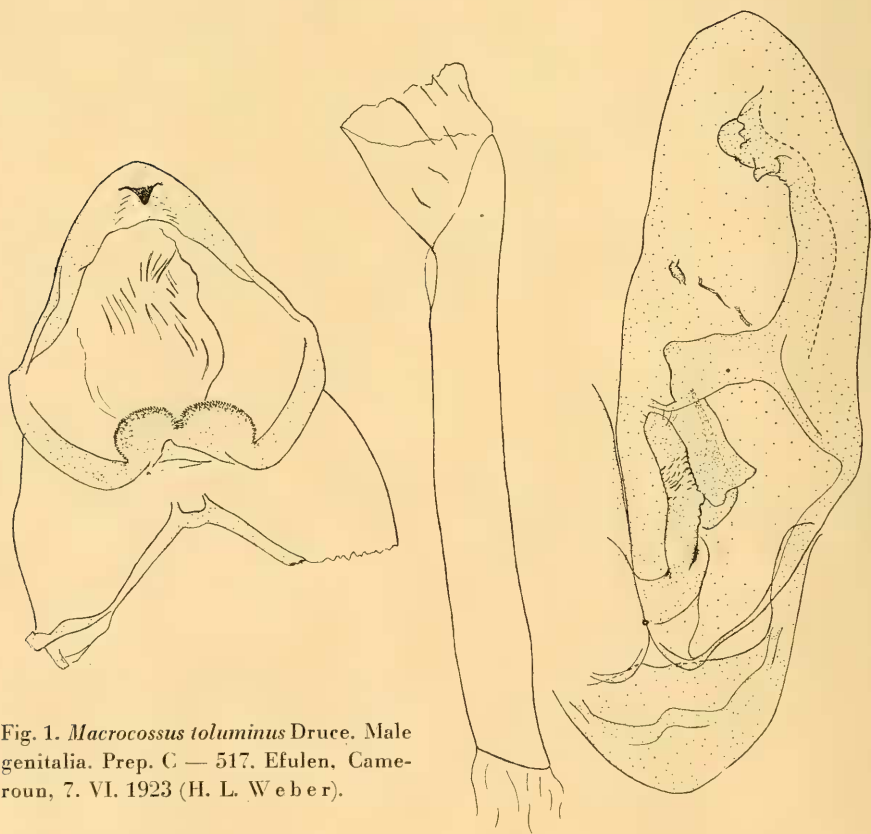


Fig. 1. *Macrocoossus toluminus* Druce. Male genitalia. Prep. C — 517. Efulen, Cameroun, 7. VI. 1923 (H. L. Weber).



In addition to the localities given by the several authors above, a series of seven males is at hand from Efulen, Cameroun (leg. Weber), bearing the following dates: 17. XI. 1922; 15, 16. II. 1923; 3, 6. IV. 1923; 7, 16. VI. 1923. Length of fore wing: 42,0—51,5 mm; mean (of the seven), 48,6 mm. The single female in the Carnegie Museum collection is from Ruo, Nyassaland, 200 ft., 30. V. 1915 (leg. R. C. Wood) and bears a note by the collector: „Sitting on a dead log, just emerged from pupa.“

*Macrocossus coelebs* n. sp. (Plate I, fig. 4)

**Male.** Palpi with appressed scaling, sordid white mixed with a few black scales; first and second segments laterally black; frons and antennal scapes appressedly scaled sordid white with some black scales; vertex with a long tuft of scales directed forward between antennal bases and projecting well beyond them, colored as frons but with black scales more numerous laterally and tinged faintly yellowish proximally; patagia colored as frons; tegulae similar but black scales nearly confined to their anterior edge leaving the rest whitish; thorax dorsally white heavily overlaid with black except in a narrow longitudinal band middorsally, widening slightly to the rear; thorax ventrally sordid white mixed with black, laterally just below base of hind wing dark gray; legs white with black intermixed, with a black band on each segment, especially of tarsi. Abdomen similarly colored but the black scales somewhat more numerous, making it darker gray to the naked eye; proximally with a broad dorsal tuft of gray scales on first segment, flattened and spreading, and a small, sharp, erect tuft on second segment.

**Upperside.** Fore wing gray (whitish mixed with black scales); proximal half of wing below cell nearly white, tinged brownish below 2A; a diffuse, dark gray-brown, triangular, postmedian shade, expanding from a narrow beginning on costa at about  $\frac{2}{3}$  to a broad base along entire distal half of inner margin; in basal parts of  $M_2$ - $M_3$ - $Cu_1$  with small quadrate white spots enclosed; a subterminal slender black line from  $R_5$  costad to costa just before apex, forking just before its end; costa with slender, short, erect black dashes from base to apex; distal half of wing, including dark postmedial shade, crossed by a sparse fine reticulation; a few of these lines aligned into a slightly heavier continuous line from  $M_3$  to 2A through the dark shade, narrowly edged on each side with pale tan. Fringe sordid white with a few dark scales at vein ends. Hind wing sordid white with a fine reticulation in distal half of wing, heaviest below  $Cu_1$  and subterminally up to costa. Fringe sordid whitish with a very few dark scales scattered at random.

**Underside.** Both wings grayish. Fore wing darker gray at cell-end and thence to apex above  $Cu_1$ ; costa with a row of fine erect black bars as on upperside. Fringe as above. Hind wing as on upperside, but the reticulation also present along costa nearly to base.

**Male genitalia.** (Fig. 2) Uncus beaked; two small bossed, the rudimentary socii, one on each side of tegumen base posterior to gnathos arms, which are moderate and support a twice convoluted median scobinate pad; anal tube ending before base of uncus; penis slightly shorter than valva, very slightly

arcuate, without external teeth, not quite 10 times as long as its diameter at middle; valva simple, compactly ovate, the dorsal edge terminally convoluted into about two coarse teeth; basal hook simple, acuminate, with a



Fig. 2. *Macrocoossus coelebs* n. sp. Male genitalia. Prep. F—23, holotype.

single large, subtriangular tooth arising near its base, pointed anteriorly; anellus lobes constricted a little beyond middle, the terminal part finely scobinate; saccus considerably broader than long.

Length of fore wing: 23.5 mm.

Holotype, male, Okahandja, S. W. Africa, 21. X. 1937 (F. Gaerdes), in the collection of the Zoologische Staatssammlung, München.

Remarks. See comparison of the three species below.

### *Macrocoossus caducus* n. sp. (Plate I, fig. 3)

Male. Antennae bipectinate to tip, longest rami about as long as 9 shaft segments; shaft dorsally sealed whitish; frons, vertex, thorax and abdomen all ashy gray; pectus brown and frons with a brownish cast. Abdomen dorsally with scaling slightly tufted on each segment. Tarsi ringed dark gray and white.

Upperside. Fore wing ashy gray; distal half with vague white patches, especially one in cell at end and a larger, vaguer one below origin of  $Cu_2$ ; reticulate moderate, nearly suppressed in basal third, strongest distally and gathered into several fairly constant heavy black lines: a transverse bar in cell at  $\frac{2}{3}$ , just beyond which a line from costal edge of cell, crossing cell at origin of  $Cu_2$ , to inner margin a little beyond middle; from origin of  $Cu_1$  another subparallel to this last, the two curved toward each other between 1A and 2A, then divergent slightly, the latter to inner margin at  $\frac{2}{3}$ ; from costa at  $\frac{2}{3}$  a diagonal postmedian line, and a subterminal line from costa at about  $\frac{2}{3}$  the distance between postmedian and apex: both sinuate, the latter incurved between about  $R_2$  and  $M_3$ , and may be interrupted or wanting below that, the two meeting at about  $Cu_1$ . An irregular series of short, slender, erect, black dashes

on costa; fringe pale gray, checked with dark gray at vein-ends. Hind wing dark brownish gray, paler in basal half of costa and less so on terminal third of wing, where a feeble reticule is apparent, forming into slender, faint, irregular transverse lines. Fringe as on fore wing but rather darker.

Underside. Fore wing gray brown, darkening to nearly black subcostally and with a shining pearl gray area between 1A and inner margin. Costal dashes evident, postmedian and subterminal lines faintly indicated; reticule otherwise absent save for faint traces terminally. Hind wing gray, shaded dark gray brown in disk, with a faint dark gray brown reticule over the whole surface.

Male genitalia. (Fig. 3) All structures rather slender and elongate; uncus beaked; no small bosses at loci of socii; arms of gnathos slender, the scobinate median pad entire; anal tube ending about at base of uncus; penis a little longer than valva, nearly straight, slightly over 18 times as long as its diameter at middle, the terminal third with a few scattered teeth externally; valva simple, elongate, with the dorsal edge subterminally convoluted into a short series of coarse teeth; basal hook simple, acuminate; anellus lobes terminally setose; saccus about a third longer than broad.

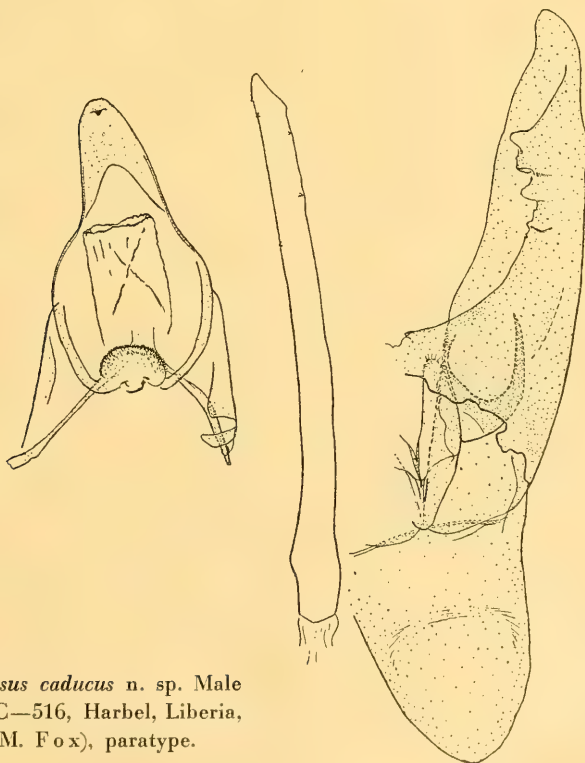


Fig. 3. *Macrocosmus caducus* n. sp. Male genitalia. Prep. C—516, Harbel, Liberia, 16. II. 1955 (R. M. Fox), paratype.



Length of fore wing: 24,5—29,0 mm.; mean (13 males), 26,4 mm. Holotype, male, Harbel, Marshall Terr., Liberia, 18. I. 1956 (R. M. Fox); 12 male paratypes: same locality and collector, dates as follows: 1955: 22. I. (2); 25. I., 27. I.; 14. II., 16. II., 17. II.; — 1956: 31. I.; 6. II.; 10. II., 11. II.; — 1957: 18. I. All types C. M. Ent. type series no. 385; paratype, slide no. C—516 (male genitalia).

Remarks. For comparison with the other species of the genus, see below. It will be noted from the dates that this species is very strongly seasonal, flying only during about the last week of January and the first two weeks of February.

### Comparison of the three species.

The three known members of the genus are so abundantly distinct one from another that instead of a key to them it may be more useful and illustrative to tabulate the major differences.

1. Length of fore wing: 42,0—51,5 mm. (mean, 48,6 mm) in *toluminus*; 23,5 mm in *coelebs*; 24,5—29,0 mm (mean, 26,4 mm) in *caducus*.

2. Fore wing costa: slightly concave in *coelebs*; slightly convex in the other two.

3. Collar: black in *toluminus*; pale gray in the other two.

4. Tegulae: pale gray in *caducus*; white in the other two.

5. Abdominal middorsal line: present in *toluminus*, absent in the other two.

6. Hind wing ground color: pale gray in *caducus*; dark brown in the other two.

7. Hind wing cross-vein from cell to Sc: at middle of cell and strong in *toluminus*; near base and faint in *caducus*; apparently absent in *coelebs*.

8. Antennal color: ruddy brown in *caducus*; black in the other two.

9. Penis: more than 18 times as long as diameter at middle in *caducus*; less than 10 times in the other two.

10. Penis: small sparse external teeth on shaft in *caducus*; absent in the other two.

11. Socii: as small setose bosses, present in *coelebs*; absent in the other two.

12. Scobinate pad of gnathos: entire in *caducus*; bilobed in the other two.

13. Saccus: longer than broad in *caducus*; broader than long in the other two.

## II. A collection of Cossidae (Lepidoptera) from South-West Africa

The *Cossidae* enumerated in this paper are the result of over twenty-five years' collecting by Herr F. Gaerdes, of Windhoek, South-West Africa, in the largely desert or semi-desert areas near his home. The roughly 140 specimens that comprise the lot average barely more than five per year over the quarter-century, a figure that is not large. It is a reflection, however, not on the activity of Herr Gaerdes but rather on the scarcity of cossids! The number of species represented is 18, a surprisingly large figure,

comparable (especially when it is considered that many more surely await discovery there) to the numbers found in the more humid parts of Africa. Although information on the subject is very scanty, it would appear that here, as well as in other desert areas of the world, the cossids do not partake in the general depauperateness of the lepidopterous fauna, or at least not to the same extent.

For the opportunity of studying and reporting on this unusual and interesting collection I am most grateful to Dr. Walter Forster, Direktor of the Zoologische Staatssammlung in München. The types of all new species are deposited in that institution; duplicate specimens, where possible, have been presented to Carnegie Museum and returned to Herr Gaerdes.

There are still too many lacunae in our knowledge of African cossids to make any very extensive observations on the zoogeography of the present material. About all that may be said at this time is that (1) the general relationships seem to be decidedly with the south and east of the continent, rather than with the Katangan or the West African regions; and (2) the genera or generic groups to which the species belong seem to be all rather widely distributed in Africa, though a sizeable proportion of the species is, so far as now known, endemic.

### Zeuzerinae.

In the absence of critical study of the characters and delimitations of the genera of this group I refer the species to the genera in which they occur, directly or indirectly, in Gaede's account of the African *Cossidae* in Seitz' *Großschmetterlinge der Erde*. In this subfamily, as in the *Cossinae*, the presence or absence of a tarsal arolium between the claws is important and has been indicated, therefore, for each species.

### Genus *Phragmataecia* Newman 1850.

Two species, strictly congeneric with the genotype (*Ph. castaneae* Hbn., of Europe), are represented in the collection, both new. They are closely related to each other and to *pallens* H.-S., and belong with *pallens*, *pelostema* Hering and *brunnea* Pagenstecher in a group that stands very near *castaneae*. In both species the longest rami of the antennal shaft of the male are about as long as six shaft segments and in both (as in *castaneae*) there is a well developed arolium between the tarsal claws.

### *Phragmataecia andarana* n. sp. (Plate II, figs. 1, 2)

Male. Head, thorax above and below, legs and fore wing above all rather pale gray tan; frontal tuft ventrally and laterally brown; abdomen and posterior part of thorax very pale tan, almost white. Fore wing above with costa inward to cell and distad almost to apex, yellow tan; inner margin inward almost to 1A and distad to tornus, yellow tan, broadest at about one-third, tapering to a point distally. In posterior part of cell and below cell a longitu-

dinal „streak“ area of brownish cross-striae, distally expanding to cover most of the distal area, but here the cross-striae are very faint. Hind wing white, edged along costa with tan.

Antennal shaft of 37—42 segments of which the distal 16—20 are uniserrate and the basal 21—22 are bipectinate (ratios of pectinate/total segments being: 0.52—0.57); the pectinate portion is pale yellow, the uniserrate portion brown; shaft and rami dorsally scaled with very pale tan, the scales rather fugitive, especially on the rami.

*Female.* Coloration as in male, except that the anterior part of the thorax is somewhat darker; antenna very short bipectinate for about 19 segments, the longest rami about 1½ shaft segments long; remaining 17 segments short uniserrate; the pectinate part is yellowish, the serrate part brown, as in the male. The frenulum is composed of three bristles.

Length of fore wing: male, 14.5—18.5 mm, mean (4 specimens), 15.9 mm; female (unique), 20.0 mm.

*Holotype*, male, Andara, Okovango, 24. XII. 1954; *Allotype*, female, the same locality, 26. XII. 1954; 3 male *paratypes*, same locality, 24, 26, 27. XII. 1954.

*Remarks.* See under next species.

### **Phragmataecia okovangae** n. sp. (Plate II, fig. 3)

*Male.* Head, thorax above, abdomen above and fore wing: all rather pale gray brown; frontal tuft ventrally a little darker; pectus broadly darker brown; abdomen and rest of thorax below pale gray; legs concolorous except tarsi which are dorsally dark brown with whitish distally. Fore wing above with costa and inner margin roughly concolorous with rest of wing; cell with small black spots along both anterior and posterior edges, but no spots beyond or below cell. Hind wing white, pale tan broadly along inner margin. Underside of fore wing smoky brownish gray, sharply but narrowly paler on costa, vaguely but broadly so on termen, and both broadly and sharply so (at least basad) on inner margin. Hind wing white, rather narrowly pale tan on costa and cream colored broadly on inner margin. Fringe of fore wing pale tan, of hind wing white.

Antennal shaft of 46—49 segments, of which the distal 23—25 are uniserrate and brown, the remaining basal 23—24 long bipectinate and yellowish; ratio of pectinate/total number of segments, 0.50—0.51; the shaft and rami dorsally scaled white, the shaft proximally more or less intermixed with brown scales.

Length of fore wing: males, 19.5—21.0 mm, mean (2 specimens), 20.2 mm.

*Holotype*, male, and 1 male *paratype*, Andara, Okovango, 24. XII. 1954.

*Remarks.* Andara, the type locality of both these species, is on the Okovango River where it traverses the narrow neck of the Caprivi Strip in the northeastern part of the country.



These two species are difficult to separate, as indeed are many species in this badly misunderstood genus. From *pallens* H.-S. and *pelostema* Hering both the present species differ in the lack of the fine reticulations (of *pallens*) or the internervural discal dark streaking and reticulations (of *pelostema*). From the more similar-appearing *castaneae* Hbn. of Europe, both differ in the bicolored antennae.

*Ph. andarana* and *okovangae* are, apparently, their own closest relatives, and may be distinguished as follows:

1. Male antenna: ratio of pectinate/total number of segments in shaft is slightly larger in *andarana* (see descriptions for figures); the shaft is dorsally sealed with mixed lighter and darker tan in *andarana*, dark brown and white in *okovangae*.

2. Thorax: darker above in *okovangae* and with a broadly darker brown pectus.

3. Legs: mixed shades of tan in *andarana*; the tarsi conspicuously dark brown and white in *okovangae*.

4. Abdomen: very pale tan, nearly whitish, in *andarana* and not or only slightly darker above than below; in *okovangae*, darker gray tan above, contrasting with the very pale whitish tan underside.

5. Fore wing: in *andarana* the tiny cross-striae occur, in the cell, only along the posterior border, but are also found below the cell and in the disk as well; in *okovangae* they occur, in the cell, along both anterior and posterior borders, but are not found outside the cell; they are, further, brownish in *andarana*, nearly black in *okovangae*; in *andarana* the costal and inner margins are conspicuously yellow-bordered, not so in *okovangae*. On the underside the costa is much more narrowly pale-bordered in *okovangae*.

6. Hind wing: inner margin pure white in *andarana*, pale tan in *okovangae*. The male genitalia (figs. 4, 5) are hardly distinct.

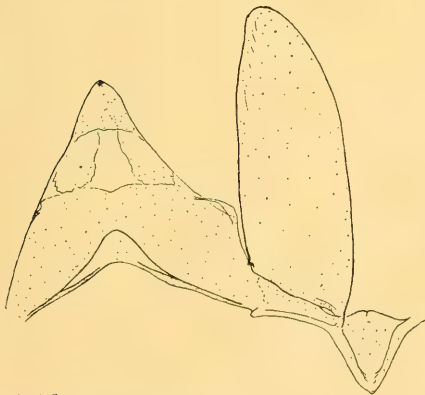


Fig. 4. *Phragmataecia andarana* n. sp. (paratype). Male genitalia: uncus and tegumen, valva and saccus.

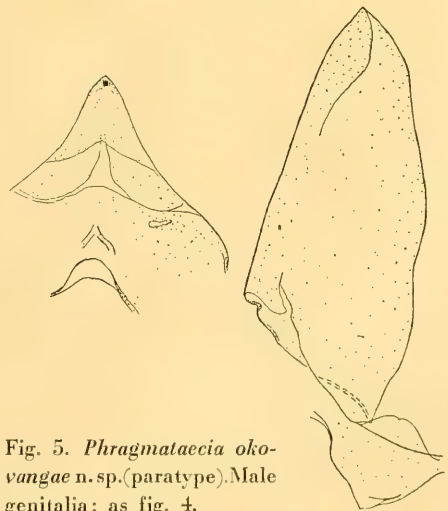


Fig. 5. *Phragmataecia okovangae* n. sp. (paratype). Male genitalia: as fig. 4.



*Azygophleps asylas* Cramer (?)

Fontein Omurumba, 7. I. 1950 (3 males); Okahandja, 31. XII. 1935 (1 female); 11. III. 1937 (1 male); Grootfontein, 21. I. 1938 (1 male); Kalidona, 20. I. 1941 (1 female); Objiwarongo, 23. IX. 1954 (1 male).<sup>1</sup>

Length of fore wing: 5 males, 14.0—17.5 mm (mean, 15.8 mm); 2 females, 16.5—20.0 mm (mean, 18.2 mm).

A strong arolium is present between the tarsal claws. The antennal shaft of the male (1 male examined) has 23 bipectinate and 25 uniserrate segments, a total of 48 shaft segments in all, with a ratio of pectinate/total numbers, of 0.48. The female antennal shaft is short biserrate for 21 segments then uniserrate for 31 segments (total shaft segments, 52). The female frenulum is composed of 3—4 bristles.

In the males the whole head, thorax and abdomen are white, except for the brown hair of the ventral part of the frontal tuft; in the female there is no brown at all on the frons.

This species clearly needs further study based on large series from many localities, unfortunately not accessible to me. Cramer's figure<sup>1</sup>) shows a large, finely cross-striate form, probably female, with some infuscation (stain?) of the hind wing. Presumably it was from the region of the Cape. A single female at hand from Natal is large (length of fore wing, 25.5 mm) but coarsely cross-striate. As a measure of the density of striation one may count the striae in interspace  $R_2$ — $R_3$  of the fore wing. For the Natal female the number is eight.

In the present series both sexes are finely cross-striate (number of striae in  $R_2$ — $R_3$ : males, 8—10; females, 12—14), approximately similar to Cramer's figure, though as the fore wing length figures above show, these specimens are very small. With the exception of the cross-striae of the fore wing, the ventral fuscous of the male frontal tuft and some fuscous on the legs, both sexes are nearly pure white.

*Azygophleps leopardina* Distant

Okahandja, 5. III. 1940 (1 female), 28. II. 1952 (1 female), 4. III. 1954 (1 female), 8. IV. 1957 (1 female); no data (1 male).

The antennal shaft of the male is composed of 59 segments, of which the basal 23 are long bipectinate (ratio, 0.39), the remainder short uniserrate; the longest rami are about as long as 5 shaft segments. The antennal shaft of the female is short biserrate, giving gradually to uniserrate distally. The transition is so gradual that no sharp point of demarcation can be discerned, but in one of the specimens it is roughly 12 biserrate, 41 uniserrate (total shaft segments, 53). The female frenulum is composed of about 5 bristles. Arolium present.

<sup>1</sup>) His description of the specimen states that the antennae are apically hooked and that a coiled proboscis is present! It sounds very much as though its original head had been replaced with that of some other species, possibly sphingid.

*Azygophleps aurivillii* Dalla Torre

Kalidona, 18. XII. 1940 (1 male, 1 female); Okahandja, 6. III. 1940 (1 female).

Obviously closely related to the preceding. The two sexes of *aurivillii* are virtually identical in pattern, wing shape and size. Arolium present. Male antennal shaft of 62 segments, of which 25 are bipectinate (ratio, 0.40); the longest rami about 6.3 shaft segments long. Female frenulum of about 5 bristles.

This and the preceding species were described from South-West Africa and apparently are known only from there.

*Xyleutes atriplaga* Le Cerf (Plate II, figs. 4, 5)

Ongombeanavita, 12—15. I. 1956 (3 males); Renatu, 13. I. 1950 (1 male); Tsumib, 1. I. 1938 (1 female).

These agree well with published descriptions, though representing a southern extension of the known range. These few specimens are rather variable *inter se*: in size (length of fore wing ranging from 24 to 31 mm in the four males), in development of the median and post-median shade-spots and especially in the coloration of the abdominal dorsum (proximally black in two of the four males, undifferentiated gray in the other two).

One male has the antennal shaft composed of 71 segments, of which the basal 27 are bipectinate (ratio,  $\frac{27}{71} = 0.38$ ), the remainder uniserrate. The longest rami of the pectinate part are about as long as 5 shaft segments. A second male has a ratio of  $\frac{24}{68} = 0.35$ , with the same proportionate ramus length.

In the single female the antenna is composed of 67 segments with a ratio of pectinate/total number of segments,  $\frac{26}{67} = 0.39$ ; the longest rami are about as long as 4 shaft segments. The frenulum is composed of 8 bristles. In both sexes the arolium is well developed between the tarsal claws.

*Kyleutes dictyotephra* n. sp. (Plate II, figs. 6, 7)

Male. Antennal shaft of between 44—52 segments, of which 16—18 are bipectinate (pectinate/total number ratio,  $\frac{16}{49} = 0.33$  to  $\frac{18}{44} = 0.41$ ), the remainder short uniserrate; longest rami about as long as 3 shaft segments; shaft and rami dorsally scaled white, with a few black scales intermixed proximally on the shaft. Between the tarsal claws is a well developed arolium.

Frons, vertex, thorax above and below all mixed black and white scales, giving an ashy gray appearance to the naked eye; legs concolorous, except tarsi which are black with slight white scaling at the apices of the segments and more ventrally; abdomen clothed with semi-appressed hair-scales, mixed black and white but with black predominating above proximally and with a nearly pure black, vaguely defined basal tuft; white predominates below.

Upperside. Fore wing ashy gray, slightly paler along costal half, with vague darker blotches and a dark gray basal patch from costa across cell and distal to about  $\frac{3}{4}$  wing length; overall a fine reticule of darker gray, the cross-striae united into a vague subterminal line, about parallel with termen;

fringe gray, darker at vein ends. Hind wing gray, paler in disk and with faint indications of cross-striae over most of the wing, darker along termen, especially near tornus. Fringe gray, dark spotted at veins-ends.

Underside. Pale gray with the upperside markings (reticule) feebly repeated; darker vein end spots on fringe somewhat more pronounced.

Female. Essentially as male, with these differences: antennal shaft almost filiform, the basal segments with slight bosses only (the distal part of antennac missing). The fore wing is a little more uniformly colored, the reticule sharper and more even. Underside darker, with the reticule a little more pronounced. The frenulum appears to have but 2 bristles, but may be damaged.

Length of fore wing: 5 males, 13.0—16.0 mm, mean 14.4 mm; 1 female, 13.0 mm.

Holotype, male, Okahandja, 27. X. 1937; Allotype, female, Omurambæ, 22. I. 1936; 4 male paratypes: three, same locality as holotype, 30. I. 1931; 1. II. 1938; 25. XI. 1937; one, Objítambi, II. 1950.

Remarks. This is one of the smaller *Xyleutes* and appears to come close to *X. obscurascens* Gaede „form., *obsoleta* Gaede (which is probably a species distinct from *obscurascens*). It differs in its much darker general coloration, rounder wings and smaller size (*obsoleta* has an expanse, according to Gaede, of 42 mm, whereas the largest male of *dictyotephra* expands only 37 mm and the smallest 30 mm). *X. obsoleta* was described from the White Nile and the present form could conceivably be only a subspecies of it. This is rather improbable from their wide geographic separation and I suspect that real differences are hidden by Gaede's most inadequate description.

### *Xyleutes forsteri* n. sp. (Plate II, figs. 8, 9)

Male. Antennal shaft of from 45—62 segments, of which 16—21 are binate (ratio of pectinate/total number, 0.34—0.41), the remainder uniserial; shaft and rami fuscous, scaled dorsally white with some black intermixed. Vertex and frons with long scales, mixed gray, blackish and white; palpi minute, blackish; collar above, as far back as fore wing base, blackish; remainder of thorax above gray to the eye, actually composed of coarsely mixed blackish and white, paler anteriorly, darkening posteriorly; thorax below mixed gray and sparse white hair scales; legs mixed black and white scales the tarsi pure white ventrally, and dorsally at segment ends, nearly black elsewhere; tarsal claws with no arolium between them. Abdomen gray, darker dorsally, with a pair of dorsolateral woolly white tufts at extreme base, just posterior to hind wing base (actually proceeding from metathorax, but appearing as part of the abdominal vestiture); end of abdomen with a blackish tuft. Dorsally the vestiture is somewhat woolly, being composed of hair scales; ventrally of appressed scales and much smoother.

Upperside. Fore wing divided longitudinally into a costal and a posterior field, the division between them sharp, running from base at 2A distally along 1A to about level of origin of  $Cu_2$  with a slight irregularity opposite cell middle; then angling slightly costad, crossing veins  $Cu_2$  and  $Cu_1$  near their



bases and arching slightly to follow just below  $M_3$  to termen. The costal field is black in the base, extending distally to about  $\frac{1}{3}$  wing length, gradually becoming paler to the gray ground color; a slight, vague blackish spot on costa at a little before  $\frac{2}{3}$ , a small sharp costal dot at  $\frac{3}{4}$ , and between the veins distally with darker gray streaks; posterior edge of the field, below lower border of the cell, jet black to base of  $Cu_1$ ; no trace of cross-striae in costal field. The posterior field is gray, paler (nearly white) in the extreme base and along the costal boundary, finely cross-striate. In some specimens there is a slight tinge of brown in the vicinity of  $Cu_2$  and 2A beyond cell. Fringe gray-brown, spotted with white between the veins. Hind wing white, costa and termen narrowly shaded with gray. Fringe as on fore wing.

**Underside.** Fore wing pale gray-tan, broadly white along inner margin, narrowly so on costa, with a few cross-striae near tornus and faintly along costa. Fringe gray-tan, white between veins. Hind wing as on upperside.

**Female.** As male, with these exceptions: antennae nearly simple, the segments in the base slightly rounded ventrally, the distal ones slightly serrate. The wings are a little more rounded; fore wing with all color darkened, especially the posterior field; the pale area in distal half of cell is slightly tinged with tan. Hind wing with the fuscous border shading more extensive, so that the white is restricted more to the base. Frenulum of about 5 bristles.

Length of fore wing: 7 males, 13.5—20.0 mm, mean 16.8 mm; 2 females, 20.0—21.0 mm, mean 20.5 mm.

**Holotype**, male, Okahandja, 14. I. 1937; **Allotype**, female, same locality, 30. I. 1937; 10 **paratypes**: 6 males and 2 females, same locality, 2. I. 1937; 25. I. 1936; 1. II. 1938; 2. II. 1937; 12. II. 1937; 14. II. 1937; 21. XII. 1937; 20. XII. 1951; 1 male, Spitzkoppie, 10. III. 1953; 1 male Ongombeanavita, 15. I. 1956.

**Remarks.** Appears to be closely allied to *X. pindarus* Fawcett (Kedai, East Africa), but grayer, without the large quadrate spot extending from near cell-end to vein 2A, the costal dark shade at  $\frac{2}{3}$  fainter and not produced posteriorly to  $Cu_2$ .

It is a pleasure to name this species in honor of Dr. Walter Forster, through whose kindness the present collection was made available for study.

### Cossinae

For a group that elsewhere seems largely to avoid the tropics, the true *Cossinae* are surprizingly numerous in Africa, though still very poorly known. The subfamily is at present in a very disorganized state, with generic assignments often doubtful and no higher classification attempted at all. As an interim measure it will be useful to divide it into two sections, possibly artificial, at least in part, but with the definite advantage in the present state of our ignorance of being based on an unequivocal character that is readily seen and quite constant, at least at generic level and below.

**Section I.** Arolium present between tarsal claws. This group is far more numerous in Africa than anywhere else, some dozen or so species having been seen from there. Only two species, in a single genus, are represented in the present lot, however.

Genus *Brachyilia* Felder

*Brachyilia* Felder 1874, Reise Novara, Lep. Het. pl. 82, fig. 7 (Genotype, *Brachyilia terebroides* Felder loc. cit.).

*Cossus*: Dalla Torre 1923, Lep. Cat. pars 29:5 pro (parte); Gaede 1929, in Seitz, Großschmett. Erde 14: 541 (pro parte).

Antennae of male rather long bipectinate to tip, the longest rami as long as 6—8 shaft segments.

Fore wing: are about half its length projecting beyond cell-end;  $R_3$  free or stalked with  $R_1$ — $R_2$ ;  $M_1$  from areole very near chorda, from chorda or from cell-end just below chorda; M forked in cell. Hind wing: cross-vein to Sc from near end of cell present (rare) or absent;  $R_s$  and  $M_1$  separate and rather remote to connate, possibly rarely very short stalked. Posterior branch of M ending above or below  $M_2$ . Frenulum present, short; retinaculum small.

Uncus broad, distally tapering, with a small acuminate terminal hook; gnathos strap-like, mesially united by a mesial, scobinate, convoluted band; valva with basal stout hook slightly to heavily scobinate; dorsal border of valva with a rounded lamellar process subapically; anellus a pair of digitate, setose processes pointing posteriorly, proximally connected to each other and to valvae by a band at the latter's base.

The most significant characters are: the bipectinate antennae, acuminate apical hook of uncus. Venation characters are almost without exception variable, though the usual separation of hind wing veins  $R_s$  and  $M_1$  is often helpful.

Since *Cossus* is a Group II genus (and differs further in its transversely lamellate antennae) it is necessary to resurrect Felder's generic name. Until the structure, especially of the male genitalia, is known for a great many more *Cossinae* species it is preferable to treat genera in the subfamily very conservatively. Thus, despite a fairly high level of structural difference between *terebroides* and the new species described below, there are still enough similarities to warrant their being placed, at least for the present, in the one genus.

*Brachyilia terebroides* Felder (Plate III, fig. 5)

*Brachyilia terebroides* Felder 1874, loc. cit. supra.

*Cossus windhoekensis* Strand 1913, Arch. Naturgesch. 78. A. 11: 87 (new synonymy).

*Cossus terebroides windhoekensis*: Gaede 1929, in Seitz, Großschmett. Erde 14: 541 (new synonymy).

Okahandja: 5. VIII. 1948 (1 male); 3. IX. 1947 „Licht“ (1 male); 2. X. 1939 (2 males); 24. X. 1935 (1 male); Kalidona: X. 1955 (1 male). Total, 6 males.

There seems to be no reason whatever for retaining the name *windhoekensis*. The present six specimens agree fully with a pair from the Transvaal (Mus. Munich) as well as with Felder's original figure (loc. cit.) and Strand's name is accordingly dropped into the synonymy here.

In addition to Gaede's specimens I have seen a male from Tsumeb (S. W. Africa) in the collection of the Musée Royal du Congo Belge (Tervuren, Belgium).

*B. terebroides* differs rather considerably from the next species: the antennal rami are longer (ca. 8 shaft segments long); the fore wing proportionately shorter and broader; on the fore wing  $R_3$  is usually separate from the stalk of  $R_4-R_5$ ;  $M_1$  arises from chorda or from cell below chorda; the fork of M in cell is short, well distad of origin of  $Cu_2$ . On the hind wing  $R_s$  and  $M_1$  are very remote; the posterior branch of forked M ends above  $M_2$ . The male genitalia (fig. 6) have a more slender gnathos, straighter penig and a definite notch in the strongly sclerotized dorsal edge of the valva subapically.

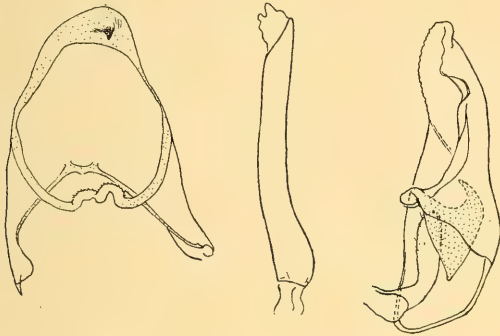


Fig. 6. *Brachylyta terebroides* Feld. Male genitalia: uncus and tegumen; penis; valva and anellus.

***Brachylyta eutelia* n. sp.** (Plate III, figs. 1, 2)

**Male.** Antennae with longest rami about as long as 7 shaft segments; the shaft dorsally scaled dull white, the rami apparently unscaled. Palpi, frons, vertex, antennal scapes, collar and thoracic dorsum and pectus all mixed white and black scales, producing an ashy gray color to the unaided eye; on vertex the scales mesially longer and produced to between the antennal bases; thorax laterally and ventrally dull white mixed with some gray. Legs white with black or dark brown scales scattered through it. Abdomen clothed with slender, almost hair-like scales, above mixed white and gray or black, with a dark gray tuft at base; ventrally white with a few gray scales intermixed.

**Upperside:** Fore wing white with numerous black scales scattered over it, general effect to the eye, gray. The veins pencilled with black; along costa a series of small black spots; at cell-end a patch of tan scales, just beyond which is a darker shaded band from just before apex diagonally (subparallel to termen) to 1A at about  $\frac{2}{3}$ , this vein thicker black where the band ends, sometimes even a black patch; the shade band is interrupted in  $M_1-M_2$  by paler gray, and below its end, between 1A and 2A, again with paler gray; a subterminal line, slender and nearly always connected, from apex to  $Cu_2$  or 1A, the ground paler on either side of it. Fringe white, interrupted broadly by dark gray at the vein-ends. Hind wing sordid white, more or less tinged faintly grayish, especially in terminal third. Fringe as on fore wing but the dark scaling at vein-ends less strong.

**Underside:** Fore wing pale gray, nearly pure white in cell and below cell and  $Cu_2$ ; small black spots along costa; the subterminal line faintly repeated. Fringe as on upperside. Hind wing as above.



Female. As in the male, with these differences: antennal rami much shorter bipectinate, the longest rami about as long as 2 shaft segments; fore wing with tan cell-end patch brighter and surrounded by nearly pure white; basal half of wing to middle of costa and to tornus very dark gray, almost black, paler only in extreme base; some tan scales below 1A at middle, in wing base, and scattered in paler area beyond middle of wing; in addition to subterminal line, the terminal half of wing bears scattered cross-striae. Hind wing and underside as in male.

Male genitalia (cf. fig. 7, of var. B). Uncus with an acuminate apical hook; gnathos rather slender; valva with a rounded lamellate process from its dorsal edge subapically; basal hook of valva profusely scobinate; penis about 0.9 as long as valva.

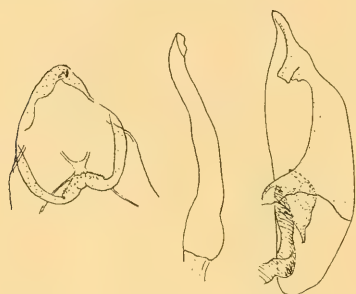


Fig. 7. *Brachyilia eutelia* n. sp. (var. B).  
Male genitalia: as fig. 6.

Length of fore wing: 11 males, 12.0—17.0 mm; mean, 14.5 mm; 2 females, 15.0—16.5 mm, mean 15.8 mm.

Holotype, male, Okahandja, 31. I. 1940; Allotype, female, same locality, 19. XI. 1949; 10 male and 1 female paratypes, same locality, dated as follops: 14. I. 1937; 1., 2. II. 1938; 5., 6., 26., 27., 28. X. 1937; 23. X. 1938; 19. XI. 1937 (males); 12. XI. 1937 (female). Paratype (1. II. 1938), male genitalia slide F—20.

Remarks. The differences between this species and *terebroides* have been given under that species above. It is hard to tell which of the described African *Cossinae* may come near to *eutelia*: published descriptions are for the most part too brief and omit too many characters. The chief reference, Gaede's work in Seitz, is of help in the figures, though these are often inaccurate; his descriptions are too short; and his generic assignments very doubtful. The described species that, considering these limitations, seem to come closest are: *Cossus kwouus* Karsch and *Coryphodema punctulata* Wlk. (as figured by Felder under the name of *capensis*), though both are so large, respectively 48 and 55 mm in expanse, that on size alone they can be separated. In addition, the pattern is quite different in both, but especially in *kwouus*.

#### *Brachyilia eutelia*, variety A (Plate III, fig. 3)

In addition to the type series there are four males from Spitzkoppie (10. III. 1953) that are a little darker and more contrastingly marked, with somewhat more numerous scattered cross-striae on the fore wing. Whether they represent a „sibling“ species, a subspecies (the localities are roughly 175 km apart),



or merely a variant pattern is impossible to ascertain. The male genitalia are identical, but this often does not signify much in the *Cossidae*. In venation they agree with the type series, save that one specimen deviates considerably: well over half the areole is beyond the cell-end on the fore wing; on the hind wing Rs and M<sub>1</sub> are connate; there is a cross-vein to Sc from the cell near its end; M<sub>2</sub> and M<sub>3</sub> are connate; and the lower branch of forked M ends at their common origin.

**Brachyilia eutelia, variety B (Plate III, fig. 4)**

Spitzkoppie, 10. III. 1953 (1 male).

This single specimen (length of fore wing, 18 mm) is larger than the largest specimen of the type series of *eutelia* and has lost the transverse strigulae everywhere except along the costa, producing a fore wing uniform gray save for a postmedian and a subterminal pale, diagonally transverse band, each vague; a blackening of 1A for about  $\frac{1}{4}$  of its length, centered at about  $\frac{2}{3}$ ; and black dots on the fringe at vein-ends. The hind wing is white as in *eutelia s. s.*, faintly shaded with grayish subterminally and apically and with grayish hair along inner margin. Thorax and abdomen as in *eutelia s. s.*

There are as well a few slight differences in the genitalia (text fig. 7): the penis slightly shorter in proportion to valva length (0.81); base of penis distinctly bulbous (not so in either *eutelia s. s.* or var. A); the subapical dorsal projection of valva more angular; basal hook of valva almost without denticulae. It should be remembered that only a single preparation of each has been studied.

This and variety A might each be good species, but without more specimens, to indicate constancy or lack of it, it seems safest to leave them without names. The fact that the specimen of variety B was captured along with those of variety A, which it most resembles in appearance, suggests that we may have to do here only with individual variants.

**Section II.** No arolium between tarsal claws. *Cossinae* belonging to this section seem to predominate and most of the genera in both Eurasia and North America belong here. In Africa the section is chiefly limited to the southern and eastern parts of the continent, only *Macrocossus* being found in the tropical West African region.

As in the preceding section, generic limits are drawn quite broadly. Among the African members belonging here all of those which I have seen may be placed in only two genera. These are distinguished as follows:

- 1 a. Hw, Rs and M<sub>1</sub> usually separate; palpi closely appressed to head, their scaling short and appressed; frontal scaling very short; thorax above thinly clothed with subappressed scales . . . . . *Macrocossus* Auriv.  
 b. Rs and M<sub>1</sub> connate or (usually) well stalked; palpi ascending but not closely appressed to head, clothed with erect spreading hairs and scales; frontal scaling loose, erect and long, often about as long as eye diameter; thorax above with deep woolly vestiture . . . . .  
 . . . . . *Arctiocossus* Feld.

Genus *Macrocoossus* Aurivillius 1901.

The genus is treated in its entirety in the paper immediately preceding this one. Only one species is represented in the Gaerde's material, though Gaede in Seitz mentions South-West Africa as a locality for *M. toliminus*.

*Macrocoossus coelebs* Clench

Okahandja, 21. X. 1937 (1 male, holotype).

Described and discriminated from the other two known congeners in the paper immediately preceding this one.

Genus *Arctiocossus* Felder 1874.

*Arctiocossus* Felder 1874, Reise Novara, Lep. Het. pl. 82, fig. 10 (Genotype, *A. antargyreus* Felder loc. cit.); Jordan 1928, Novit. Zool. 34: 140—141, pl. 3, figs. 40, 41 (redescription).

? *Pecticossus* Gaede 1929, in Seitz, Großschmett. Erde 14:542 (Genotype, *P. castaneus* Gaede, loc. cit.).

As used here the genus is certainly too conservative. Gaede's *Pecticossus* is probably valid, separable on the male genital traits given in the key below; similarly, the species *poliopterus*, described below, is probably also worthy of generic rank, based on its very characteristic genital features. Several reasons, however, have prompted this conservatism. First, I have not seen the genitalia of *antargyreus*, the genotype of *Arctiocossus* and thus a critical species in any subdivision of the genus; second, the single South African specimen I have referred to *castaneus*, the genotype of *Pecticossus*, is only tentatively so identified (see below), leaving the identity of this genus on rather uncertain footing; third, one other generic name has been proposed, *Coryphodema* Felder (genotype, *C. capensis* Feld.), which very possibly falls in this group but of which I have seen no specimens at all. In view of these uncertainties it seems much preferable to treat the genus in a broader sense, reserving formal subdivision for some future time when more of the critical material is available.

Partial key to species, *Arctiocossus*.

This key embodies, with one exception, only those forms I have been able to study myself. The single exception is *A. antargyreus* Felder, as redescribed by Jordan (loc. cit.). There are certainly others, but available descriptions are hopelessly inadequate, not only to place them in the key but even to be sure that they belong to the genus at all.

- 1 a. Median scobinate pad of gnathos greatly enlarged and spatulate; penis proportionately very stout (diameter at middle ca.  $\frac{1}{6}$  total length); basal hook of valva acuminate with a few large denticulae . . . . . *poliopterus* n. sp.  
 b. Scobinate pad not thus enlarged, not spatulate; penis much more slender (diameter at middle ca.  $\frac{1}{11}$ — $\frac{1}{14}$  total length); basal hook of valva blunt, without denticulae . . . . . 2  
 2 a. Penis abruptly and strongly bent at about middle; anellus lobes slightly spatulate; hw, Rs and  $M_1$  separate (a/c Gaede) or connate . . . . . *castaneus* Gaede  
 (see note 1 at end of key)  
 b. Penis only slightly curved; anellus lobes digitate, slightly tapering; hw, Rs and  $M_1$  stalked . . . . . 3

- 3 a. Fw, fork of M about as long as chorda (internal vein of areole); longest rami of male antenna about as long as 7—8 shaft segments . . . . . 4  
 b. Fw, fork of M about twice as long as chorda; longest rami of male antenna 3—13 shaft segments long . . . . . 5
- 4 a. Fw above nearly uniform gray with a postmedian row of radial internervural dashes, much as in *A. danieli* (pl. III, fig. 6) . . . . . *antargyreus* Feld.  
 (see note 2 at end of key)  
 b. Fw above variegated with brownish and with a more or less distinct reticule subterminally gathered into a roughly continuous (at least costally) line . . . . . *tessellatus* n. sp.
- 5 a. Longest rami of male antenna 9 or less times as long as a shaft segment; length of fw 15 mm. or less . . . . . sp. A  
 b. Longest rami of male antenna 10 or more times as long as a shaft segment; length of fw 17 mm. or more (usually much more) . . . . . 6
- 6 a. Hw above, except basally and costally, uniform dark gray brown; uncus of male genitalia at least twice as long as width at base of uncus . . . . . *gaerdesi* Dan.  
 b. Hw above distally light tan, the veins darker; uncus barely as long as breadth at base . . . . . *danieli* n. sp.

Note 1. *Arctiocossus castaneus* Gaede (?). A single male, labelled „Aliwal North, Kapland“ (coll. Zool. Sammlg. Munich) has been tentatively identified as this species. It differs in its venation from the brief generic description of *Pecticossus* given by Gaede (loc. cit.) in that fw vein  $M_1$  arises from end of chorda (which in Gaede's phraseology would be „from upper angle of cell“), whereas Gaede describes it as arising from below the upper angle; and by having hw veins  $R_s$  and  $M_1$  connate rather than „widely separated“ as given by Gaede. The latter point is especially worrisome, though either of these features, as is so often true of venation characters in the *Cossinae*, is likely to vary. In pattern, color and size, however, it agrees well with the description of *castaneus*.

Note 2. *Arctiocossus antargyreus* Felder. I have not seen this species, nor have I therefore been able to examine its genitalia. The combination of Jordan's excellent redescription (loc. cit.) and pattern analogies with other species permit its placement here with some confidence.

### *Arctiocossus poliopterus* n. sp. (Plate III, fig. 9)

Male. Antennae composed of about 42 shaft segments; bipectinate, the longest rami about as long as 6 shaft segments; shaft thickly and rami sparsely scaled white dorsally, with a few gray scales intermixed; palpi rather short, upturned, suberectly scaled, mesially and ventrally white, laterally white strongly mixed with black hair scales; frons and vertex with mixed white and black erect hair scales, somewhat longer on vertex, forming a weak mesial tuft; antennal scapes similarly scaled.

Thorax of mixed white and black scales, the latter sparse, somewhat more numerous laterally and posteriorly, and anteriorly (on collar) forming a pair of weak parallel transverse lines, one at end of collar scaling, one just before it, white between; ventrally similar, though scales longer, hairlike; legs white with scattered black scales on femur and tibia, and a broad black band at middle of each tarsal segment. Abdomen very pale gray-tan, nearly white; a minute black tuft middorsally near base.

Venation:  $R_2$ — $R_5$  all from areole which is small, projecting about  $\frac{1}{3}$  of its length beyond cell-end;  $R_2$  free,  $R_3$  connate with stalk of  $R_4$ — $R_5$ ;  $M_1$  from cell-end well below areole; fork of M in cell rather long, arising before areole and  $Cu_2$ , its posterior branch ending at base of  $M_2$ . Hind wing with cross-vein to Sc from cell before upper angle;  $R_s$  and  $M_1$  connate; M forked in cell,



both branches ending between  $M_1$  and  $M_2$ ; cell-end deeply inangled between these veins;  $M_2$  and  $M_3$  very close, nearly connate. Frenulum present, engaging a well-developed retinaculum on fore wing.

**Upperside.** Fore wing pale gray; cross-striae numerous but faint, aligned into irregular lines roughly perpendicular to costa; on costa the striae are black and the ground between them nearly white, giving a checked appearance to costal edge; the striae are also darkened just beyond cell-end, and as a single, slender black line crossing cell at about  $\frac{2}{3}$  its length, abruptly bifurcating at about vein 1A, with a third line from the fork directed basad along that vein. At lower angle of cell the ground is nearly pure white. Fringe sordid white, dark checked at vein-ends and with a very faint dividing line at its middle. Hind wing slightly brownish dark gray shading in basal fourth to pale gray tan. Fringe basally whitish, distally dark.

**Underside.** Fore wing gray-tan; costa nearly white, with fine dark cross-striae; distal half of wing darker smoky gray save for a narrow terminal pale gray band; just beyond cell-end a small dark gray double mark. Fringe mixed dark gray and white scales, slightly checkered. Hind wing pale gray tan, darkening beyond middle to smoky gray brown; basal area flecked with sparse dark scales.

Male genitalia (fig. 8). Uncus tapering, rather bluntly pointed; scobinate pad of gnathos very large, ovate, projecting posteriorly; valva simple, without teeth or notches on margin; basal hook present, acuminate, with a few coarse denticulae; lobes of anellus long, very broad (about half as broad as long); penis short (diameter at middle about  $\frac{1}{6}$  total length), stout, slightly curved, distal aperture strongly diagonal, otherwise simple.

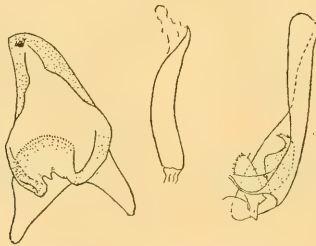


Fig. 8. *Arctiocossus poliopterus* n. sp. (holotype). Male genitalia: as fig. 6.

Length of fore wing : 12 mm.

Holotype, male, Brandberg, 14. X. 1952 (male genitalia slide F—9).

**Remarks.** The form of the scobinate pad and the stout penis immediately set this species apart from the others of the genus which I have seen. In appearance it seems to come rather near to „*Cossus*“ *breviculus* Mabille (Gaede 1929, in Seitz, Großschmett. Erde 14: 542, pl. 79 d (poor figure), and 79 e (under the synonymous name *crassilineatus* Gaede); Viette 1951, Nat. Malgache 3: 135, pl. 3, fig. 4), a Madagascan species which differs in being brown-shaded on the fore wing, and with a rather strong diagonal ante-medial line (according to Gaede) on that wing. Whether the two are actually

allied can, of course, only be learned when the structure of the two can be compared. From the general appearance of *crassilineatus*, however, it is not inconceivable.

**Arctiocossus fessellatus** n. sp. (Plate III, figs. 7,8)

**Male.** Antenna with about 58 shaft segments, bipectinate to tip, longest rami about 8 shaft segments long; rami sparsely scaled whitish; shaft dorsally scaled pale tan with scattered black scales; palpi, frons and vertex pale tan with intermixed black scales; scales of vertex produced in a short tuft between antennae; patagia, tegulae and thoracic dorsum similarly colored; abdomen pale tan, ventrally with some black scales intermixed at least basally; thorax ventrally with pale tan hair scales, with a few black intermixed; legs banded with black and tan (tarsi with the black as a middle ring on each subsegment).

**Upperside.** Fore wing pale tan, heavily mixed with various shades of gray-brown, the effect to the unaided eye being gray-brown with a pale tan streak subcostally; a rusty patch in interspace just below origin of  $Cu_2$ , crossed by one or two fine black cross-striae; and a few rusty scales scattered in the disk; fine black cross-striae scattered irregularly and not very visibly on the gray ground: most noticeable along costa and in disk, subapically aligned in a slender line, parallel to termen from costa almost at apex to  $M_3$  or  $Cu_1$ ; fringe pale tan between veins, gray-brown at vein-ends. Hind wing gray-brown, shading to pale rusty tan in base and along inner margin; fringe too rubbed for description, but appears to be checkered as on fore wing, though perhaps more obscurely.

**Underside.** Fore wing with cell pale tan; remainder of wing except inner margin gray with faint indications of darker cross-striae; costal edge alternating pale tan and dark gray, in distal half rusty tan and black. Inner margin below 2A sordid white with a few gray cross-striae. Hind wing as on upperside but with faint cross-striae in disk; costal third of wing tan with black scales intermixed.

**Female.** Antennae of about 49 shaft segments (1 specimen counted), bipectinate to tip, longest rami about 3 shaft segments long. Head, body and leg colors about as in male but more contrasting, the tan areas of the male being replaced by white; abdomen dorsally with hair scales in basal half, spatulate scales in distal half; venter entirely clothed with spatulate scales; spatulate-scaled areas whitish with many black scales intermixed, increasingly so posteriorly, the effect to the eye being pale gray dorsally, paler in base, darkening to tip; there is a faint, proximal, middorsal tuft.

**Upperside.** Fore wing about as in male but more contrasting, the gray areas darker, the tan areas nearly white; rusty patch below origin of  $Cu_2$  much less evident, the rusty scales few, paler, and most have become whitish; as in male, crossed by one or two black cross-striae; at about  $\frac{1}{3}$  the length of interspace  $M_3-Cu_1$  a pure white spot in that interspace; terminal area paler gray, with the subterminal line as in the male; in several specimens this line is continued to  $Cu_2$ , by a disjunct diagonal line from cell toward termen. Hind wing as in male but paler. Fringe of fore wing obscurely checkered; of hind wing nearly uniform grayish, paler distally.

Underside. Both wings pale grayish tan, darkening to rather pale gray beyond cell, where a few darker grayish cross-striae occur; costa of fore wing checkered black and pale gray (the latter actually of mixed white and black scales).

Frenulum of about 5 bristles.

Venation, both sexes. Fore wing:  $R_3$  free from areole or short stalked with  $R_4$ — $R_5$ ;  $M_1$  from areole, chorda, or cell-end below chorda; fork of M about as long as chorda, its lower vein usually ending at base of  $M_2$ . Hind wing: no cross-vein from cell-end to Sc (in allotype a short, spur-like trace, on one side only);  $R_s$  and  $M_1$  stalked for variable length; lower branch of forked M ends above  $M_2$ ;  $M_2$ ,  $M_3$  and  $Cu_1$  close, subequally spaced,  $Cu_2$  remote.

Male genitalia (fig. 9). Uncus rounded, with subparallel sides; socii indicated by slight swellings of margins with erect setae; gnathos arms strap-like, the scobinate median pad slender with stout teeth, about as wide as uncus; valva entire; dorsal edge convex (viewed from above), smooth and stout, with a slight subapical rounded boss, beyond which the valva is feebly sclerotized; basal hook curved, simple, blunt-tipped; lobes of anellus tapering, blunt, extending just beyond transtilla; penis strongly curved at about  $\frac{1}{3}$  from base, beyond curve straight and cylindrical; about 11 times as long as diameter at middle; base without caecum, strongly flared.

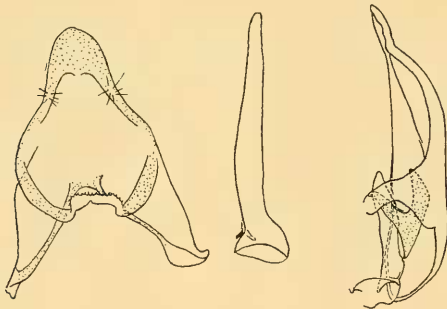


Fig. 9. *Arctiocossus tessellatus* n. sp. (holotype). Male genitalia: as fig. 6.

Length of fore wing: male (1 only), 13.5 mm; female, 12.5—17.0 mm, mean (5 specimens), 14.3 mm.

Holotype, male, Stampriet, S. W. Africa, 27. IX. 1952 (male genitalia slide F—15); Allotype, female, Okahandja, 5. XII. 1937; paratypes, 7 females: 1, same data as holotype; 6, same locality as allotype, dated respectively 21. II. 1938; 22. II. 1952; 1. III. 1956; 5. X. 1937 (2); 5. X. 1938.

Remarks. Despite its very different appearance, which strikingly recalls the female of *Brachylia eutelia* (described above), this species comes very near *A. danieli* in all points of structure. The differences in male genital structures can be seen from the figures.

#### *Arctiocossus danieli* n. sp. (Plate III, fig. 6)

Male. Antenna of about 72 shaft segments, bipectinate to tip, longest rami about 11 shaft segments long; antenna dorsally scaled creamy white; palpus with erect short sordid whitish scales and long erect hair scales intermixed,



dark brown laterally, whitish ventrally and mesially; frons and vertex of slender scales and hair scales, mostly grayish white, with some fuscous intermixed; thorax dorsally with elongate scales, whitish with some fuscous intermixed, the effect to the naked eye being pale gray. Thorax ventrally with creamy white, long woolly hair scales; legs sordid whitish with some fuscous scaling on all segments — on those of tarsi consisting of a small, nearly central, dorsal fuscous patch on each subsegment.

**Upperside.** Fore wing sordid whitish in base, becoming pale brownish gray in median and distal areas, the veins all pencilled narrowly with black. Costa narrowly and obscurely marked by a series of fuscous dashes; basal fourth of cell  $M_2$ — $M_3$  fuscous; basal third of cell  $M_3$ — $Cu_1$  white; just beyond middle of wing a pair of brownish fuscous streaks on either side of vein 1A, enlarged distad and separated by a broad white streak on the vein. From  $R_5$  to  $Cu_1$  a subterminal series of small internervural fuscous dashes. Fringe white with a pale grayish brown median dividing line and darker grayish brown spots at the vein-ends, each with one or two basal white scales. Hind wing with basal third and costal area before middle whitish pale tan, gradually darkening distad to light tan, the veins slightly darker. Fringe as on fore wing but the median line and vein-end patches much paler.

**Underside.** Fore wing whitish in basal two-thirds and along costa to apex, gradually becoming pale tan distally to termen; a few fuscous cross-striae along costa; subterminal internervural brown streaks located as on upperside; between  $Cu_2$ —1A and 1A—2A larger, swollen streaks at middle of wing, continued more narrowly distad; at each vein-end a small fuscous spot; fringe white, with a median gray-brown dividing line and at each vein-end a fuscous patch only distad of the dividing line. Hind wing pale tan, darker along costa in basal half, except for a linear pure white streak along the whole costa itself; cell pure white. Fringe as on fore wing but the line and patches paler.

**Male genitalia** (fig. 10). Uncus entire, rather broad, rounded at tip; gnathos arms strap-like, wide, the median scobinate pad very slender and broad; valva entire, dorsal edge broadly rounded, with a subterminal swelling; basal hook somewhat angulately curved, very blunt-tipped; lobes of anellus tapering, setose, blunt; penis curved at about  $\frac{1}{3}$  from base; beyond the curve straight and cylindrical; about 15 times as long as diameter at middle; base without caecum, strongly flared.

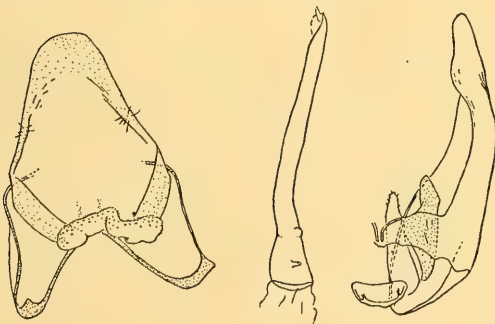


Fig. 10. *Arctiocossus danieli* n. sp. (holotype). Male genitalia: as fig. 6.



Length of fore wing: 20 mm.

Holotype, male, Wlotzkabaken, S. W. Africa, 6. I. 1954 (male genitalia slide F—8).

Remarks. In pattern apparently closely allied to *antargyreus* Felder and *punctifera* Gaede (1929, in Seitz, Großschmett. Erde 14: 543, pl. 79e). From the former it differs in being very much larger (Felder's figure of *antargyreus* shows a fore wing length of only 11 mm), the fore wing paler and consequently less contrasting compared with the hind wing, and more variegated; Felder's figure does not show either the fuscous band of cell  $M_2$ — $M_3$  nor the white base of cell  $M_3$ — $Cu_1$ . In addition, Jordan, in his redescription of the type of *antargyreus*, gives the antennal rami as 7 shaft segments long, whereas in *danieli* they are 11 segments long. From Gaede's species, so far as I can tell from its inadequate description and possibly inaccurate illustration, it differs in being larger and in lacking any trace of yellowish in the pattern of the fore wing. Despite their great difference in pattern, many features of the genitalia and other structures reveal the close relationship that exists between this species and the preceding, *tessellatus*.

This species is named in honor of Herr Franz Daniel, of the Zoologische Staatssammlung in München, a well known student of the Palearctic *Cossidae*.

#### *Arctiocossus* sp. A (*antargyreus* Felder?)

Wlotzkabaken, 28. 1956 (2 males, badly damaged and rubbed).

In size (length of fore wing 13 mm and 15 mm) and shape, in what can be seen of the pattern (fore wing apparently uniform gray, with postmedial series of internervural black dashes and a pair of long black dashes on either side of 1A, that above it being larger; hind wing uniform, paler gray), even in the presence on one of them of a faint, slender middorsal line on the abdomen, as well as in the presence of a tuft of long scales on the vertex passing anteriorly between the antennal bases, these two agree well with *antargyreus* Felder, as figured by that author (Reise Novara, Lep., pl. 82, fig. 10) and as discussed and described by Jordan (loc. cit.).

Three discordant points keep me from asserting this identification with confidence: first, the length of the longest antennal rami is respectively 8 and 9.5 shaft segments, whereas Jordan gives the length as 7; second, the fork of the median stem of the fore wing in both these specimens is twice as long as the chorda, rather than equal to it, as in Jordan's figure of the venation of the type; and third, Jordan describes the type of *antargyreus* as lacking a retinaculum, but in both the specimens at hand a small retinaculum is present.

Each of these points is minor and could be explained by individual variation, slight errors of observation or of drawing; but until the type has been compared with these points specifically in mind; until a comparison of male genitalia; and until a longer series has been studied to determine the nature and extent of individual variation: until these conditions are met, it seems best to reserve judgement on the identification.

**Arctiocossus sp. B**

Marintal (spelling?), 2. X. 1937 (1 male). Rubbed almost scaleless.

**Arctiocossus gaerdesi** Daniel (fig. 11)

*Pectiocossus gaerdesi* Daniel 1956, Mitt. Münchn. Ent. Ges. 46: 239, pl. 11.

Holotype and 47 male paratypes, Wlotzkabaken, 4.—14. I. 1954.

Herr Daniel has lately described this species from a magnificent series of males taken by Herr Gaerdes. As can be seen from Daniel's plate, there is extensive variability in the pattern of the fore wing.

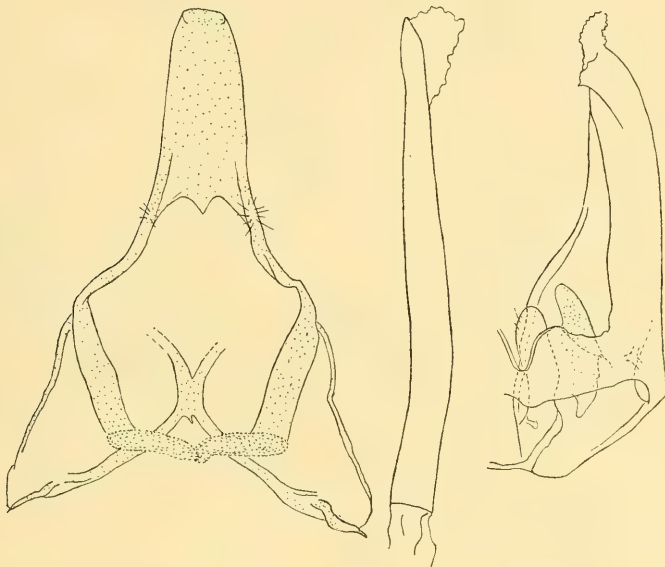


Fig. 11. *Arctiocossus gaerdesi* Daniel (paratype). Male genitalia: as fig. 6.

In addition to the type series, Herr Gaerdes has subsequently taken two specimens (same locality, 28. XII. 1956), one of which is the hitherto unknown female. This may be briefly and comparatively described as follows: The hind wing is pale tan, considerably paler than in the male; the fore wing subterminal lines are absent; the fore wing discal area is darker and there is a darker brown, more prominent reticule. The wing shape is more rounded, especially the fore wing costa and termen. Dorsally the thorax is shaded with gray, whereas in the male it is pure creamy white. The frenulum is composed of 6—7 bristles.

Anschrift des Verfassers:

Harry K. Clench, Carnegie Museum, Pittsburgh 13, Penna., U.S.A.

### Explanation of Plate I

- Fig. 1. *Macrocossus toluminus* Druce, Male, Efulen, Cameroun, 3. IV. 1923 (H. L. Weber).
- Fig. 2. Same. Female, Ruo, Nyassaland, 30. V. 1915 (R. C. Wood).
- Fig. 3. *Macrocossus caducus* n. sp. Holotype, male, Harbel, Liberia, 18. I. 1956 (R. M. Fox).
- Fig. 4. *Macrocossus coelebs* n. sp. Holotype, male, Okahandja, S. W. Africa, 21. X. 1937 (F. Gaerdes).